

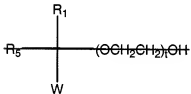
Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

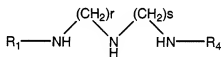
Listing of Claims:

Claims 1 to 16. (Canceled)

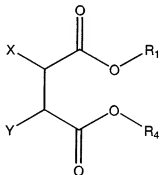
17. (Currently Amended) A process rinse solution to reduce at least one defect selected from pattern collapse and line width roughness on the surface of a substrate that has been patterned and developed, the solution comprising an aqueous solvent, a non-aqueous solvent, and at least one surfactant selected from the group of surfactants having the formula (III), (IVa), (IVb), (V), (VI), (VII), ~~(VIII)~~, (IXc), (Xa), or (Xd):



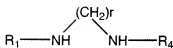
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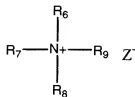
IVa



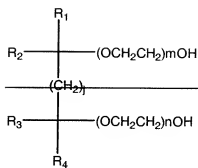
V



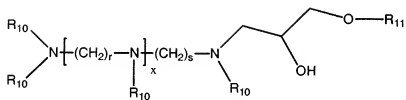
IVb



VI



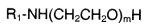
VII



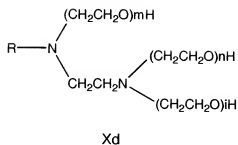
VIII



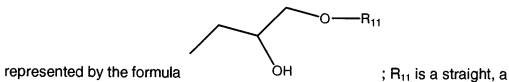
IXc



Xa



wherein R, R₁, R₄, and R₁₂ are each independently a straight, a branched, or a cyclic alkyl group having from 3 to 25 carbon atoms; ~~R₂ and R₃ are each independently a hydrogen atom or a straight, a branched, or a cyclic alkyl group having from 1 to 5 carbon atoms;~~ R₅ is a straight, a branched, or a cyclic alkyl group having from 1 to 10 carbon atoms; R₆ is a straight, a branched, or a cyclic alkyl group having from 4 to 16 carbon atoms; R₇, R₈, and R₉ are each independently a straight, a branched, or a cyclic alkyl group having from 1 to 6 carbon atoms; R₁₀ is a hydrogen atom or a group

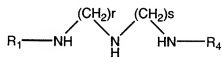


branched, or a cyclic alkyl group having from 4 to 22 carbon atoms; W is a hydrogen atom or an alkynyl group; X and Y are each independently a hydrogen atom or a hydroxyl group; Z is ~~a halide atom,~~ a hydroxyl group, an acetate group, or a carboxylate group; i, m, and n are each independently a number that ranges from 0 to 20; r and s are each independently 2 or 3; t is a number that ranges from 0 to 2; j is a number that ranges from 1 to 5; and x is a number that ranges from 1 to 6.

18. (Original) The process solution of claim 17 wherein the non-aqueous solvent is miscible in the aqueous solvent.

19. (Canceled)

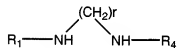
20. (Original) The process solution of claim 17 wherein the at least one surfactant is a surfactant having the following formula (IVa):



IVa

wherein R₁ and R₄ are each independently a straight or a branched alkyl group having from 3 to 25 carbon atoms and r and s are each independently 2 or 3.

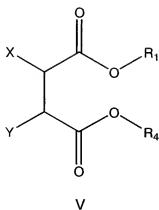
21. (Original) The process solution of claim 17 wherein the at least one surfactant is a surfactant having the following formula (IVb):



IVb

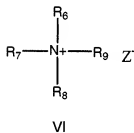
wherein R₁ and R₄ are each independently a straight or a branched alkyl group having from 3 to 25 carbon atoms and r is 2 or 3.

22. (Original) The process solution of claim 17 wherein the at least one surfactant is a surfactant having the following formula (V):



wherein R₁ and R₄ are each independently a straight or branched alkyl group having from 3 to 25 carbon atoms and X and Y are each independently a hydrogen atom or a hydroxyl group.

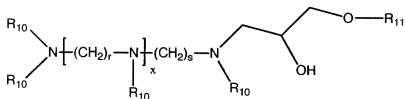
23. (Currently Amended) The process solution of claim 17 wherein the at least one surfactant is a surfactant having the following formula (VI):



wherein R₆ is a straight or a branched alkyl group having from 4 to 16 carbon atoms; R₇, R₈, and R₉ are each independently a straight or a branched alkyl group having from 1 to 6 carbon atoms; and Z is a halide atom, a hydroxyl group, an acetate group, or a carboxylate group.

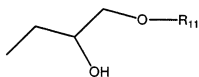
24. (Canceled)

25. (Original) The process solution of claim 17 wherein the at least one surfactant is a surfactant having the following formula (VIII):



VIII

wherein R₁₀ is a hydrogen atom or a group represented by the formula



; R₁₁ is independently a straight, branched, or cyclic alkyl group having from 4 to 22 carbon atoms; r and s are each independently 2 or 3; and x is a number that ranges from 1 to 6.

26. (Canceled)
27. (Canceled)
28. (Original) The process solution of claim 17 wherein the at the at least one surfactant is a surfactant having the following formula (IXc):



IXc

wherein R_1 , R_4 , and R_{12} are each independently a straight, a branched, or a cyclic alkyl group having from 3 to 25 carbon atoms.

29. (Original) The process solution of claim 17 wherein the at the at least one surfactant is a surfactant having the following formula (Xa):



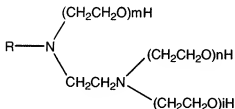
Xa

wherein R_1 is a straight, a branched, or a cyclic alkyl group having from 3 to 25 carbon atoms; and m is a number that ranges from 0 to 20.

30. (Canceled)

31. (Canceled)

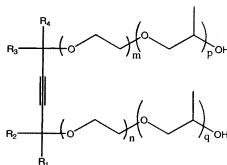
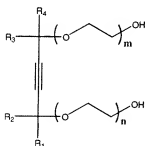
32. (Original) The process solution of claim 17 wherein the at the at least one surfactant is a surfactant having the following formula (Xd):



Xd

wherein R is independently a straight, a branched, or a cyclic alkyl group having from 3 to 25 carbon atoms; and i , m , and n are each independently a number ranging from 0 to 20.

33. (Canceled)
34. (Canceled)
35. (Previously Presented) The process solution of claim 17 wherein the non-aqueous solvent is at least one selected from the group consisting of: ethylether, ethylene glycol monomethyl ether, 2-methoxyethyl ether, a nitrile, lactates, pyruvates, diols, tetrahydrofuran, acetone, 1,4-dioxane, 1,3-dioxolane, ethyl acetate, cyclohexanone, acetone, 1-methyl-2-pyrrolidone, methyl ethyl ketone, dimethylformamide, dimethylacetamide, N-methyl pyrrolidone, ethylene carbonate, propylene carbonate, glycerol and derivatives, acetic acid anhydride, propionic acid and propionic acid anhydride, dimethyl sulfone, benzophenone, diphenyl sulfone, phenol, m-cresol, dimethyl sulfoxide, diphenyl ether, propylene glycol propyl ether, methanol, ethanol, 3-heptanol, 2-methyl-1-pentanol, 5-methyl-2-hexanol, 3-hexanol, 2-heptanol, 2-hexanol, 2,3-dimethyl-3-pentanol, propylene glycol methyl ether acetate, ethylene glycol, isopropyl alcohol, n-butyl ether, propylene glycol n-butyl ether, 1-butoxy-2-propanol, 2-methyl-3-pentanol, 2-methoxyethyl acetate, 2-butoxyethanol, 2-ethoxyethyl acetoacetate, 1-pentanol, and propylene glycol methyl ether.
36. (Previously Presented) The process solution of claim 17 further comprising at least one surfactant selected from the group consisting of formula (I) and (II):

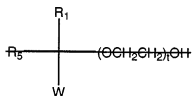


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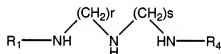
11

wherein p and q are each independently a number from 0 to 20.

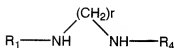
37. (Currently Amended) A process rinse solution to reduce at least one defect selected from pattern collapse and line width roughness on the surface of a substrate that has been patterned and developed, the solution consisting of an aqueous solvent, a non-aqueous solvent, and at least one surfactant selected from the group of surfactants having the formula (III), (IVa), (IVb), (V), (VI), (VII), (VIII), (IXa), (IXb), (IXc), (Xa), (Xb), (Xc), or (Xd):



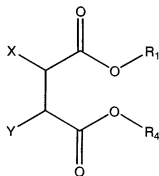
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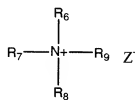
IVa



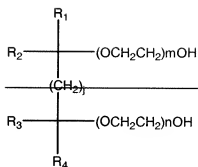
IVb



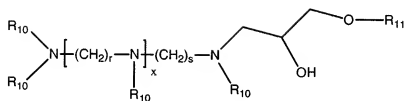
V



VI



VII



VIII



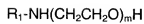
IXa



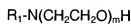
IXb



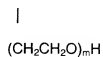
IXc



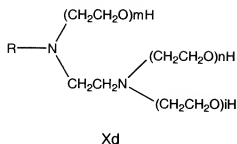
Xa



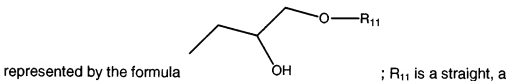
Xb



Xc



wherein R, R₁, R₄, and R₁₂ are each independently a straight, a branched, or a cyclic alkyl group having from 3 to 25 carbon atoms; R₂ ~~is~~ and R₃ are each independently a hydrogen atom or a straight, a branched, or a cyclic alkyl group having from 1 to 5 carbon atoms; R₅ is a straight, a branched, or a cyclic alkyl group having from 1 to 10 carbon atoms; R₆ is a straight, a branched, or a cyclic alkyl group having from 4 to 16 carbon atoms; R₇, R₈, and R₉ are each independently a straight, a branched, or a cyclic alkyl group having from 1 to 6 carbon atoms; R₁₀ is a hydrogen atom or a group

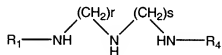


branched, or a cyclic alkyl group having from 4 to 22 carbon atoms; W is a hydrogen atom or an alkynyl group; X and Y are each independently a hydrogen atom or a hydroxyl group; Z is ~~a halide atom,~~ a hydroxyl group, an acetate group, or a carboxylate group; i, m, and n are each independently a number that ranges from 0 to 20; r and s are each independently 2 or 3; t is a number that ranges from 0 to 2; j is a number that ranges from 1 to 5; and x is a number that ranges from 1 to 6.

38. (Previously Presented) The process solution of claim 37 wherein the non-aqueous solvent is miscible in the aqueous solvent.

39. (Canceled)

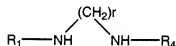
40. (Previously Presented) The process solution of claim 37 wherein the at least one surfactant is a surfactant having the following formula (IVa):



IVa

wherein R_1 and R_4 are each independently a straight or a branched alkyl group having from 3 to 25 carbon atoms and r and s are each independently 2 or 3.

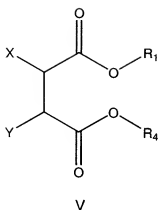
41. (Previously Presented) The process solution of claim 37 wherein the at least one surfactant is a surfactant having the following formula (IVb):



IVb

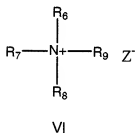
wherein R_1 and R_4 are each independently a straight or a branched alkyl group having from 3 to 25 carbon atoms and r is 2 or 3.

42. (Previously Presented) The process solution of claim 37 wherein the at least one surfactant is a surfactant having the following formula (V):



wherein R_1 and R_4 are each independently a straight or branched alkyl group having from 3 to 25 carbon atoms and X and Y are each independently a hydrogen atom or a hydroxyl group.

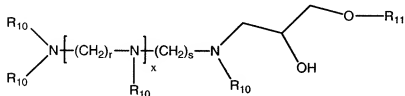
43. (Currently Amended) The process solution of claim 37 wherein the at least one surfactant is a surfactant having the following formula (VI):



wherein R_6 is a straight or a branched alkyl group having from 4 to 16 carbon atoms; R_7 , R_8 , and R_9 are each independently a straight or a branched alkyl group having from 1 to 6 carbon atoms; and Z is a halide atom, a hydroxyl group, an acetate group, or a carboxylate group.

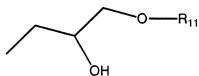
44. (Canceled)

45. (Previously Presented) The process solution of claim 37 wherein the at least one surfactant is a surfactant having the following formula (VIII):



VIII

wherein R₁₀ is a hydrogen atom or a group represented by the formula



OH ; R₁₁ is independently a straight, branched, or cyclic alkyl group having from 4 to 22 carbon atoms; r and s are each independently 2 or 3; and x is a number that ranges from 1 to 6.

46. (Previously Presented) The process solution of claim 37 wherein the at the at least one surfactant is a surfactant having the following formula (IXa):



IXa

wherein R₁ is a straight, a branched, or a cyclic alkyl group having from 3 to 25 carbon atoms.

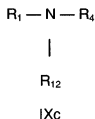
47. (Previously Presented) The process solution of claim 37 wherein the at the at least one surfactant is a surfactant having the following formula (IXb):



IXb

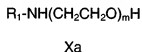
wherein R₁ and R₄ are each independently a straight, a branched, or a cyclic alkyl group having from 3 to 25 carbon atoms.

48. (Previously Presented) The process solution of claim 37 wherein the at the at least one surfactant is a surfactant having the following formula (IXc):



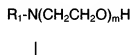
wherein R₁, R₄, and R₁₂ are each independently a straight, a branched, or a cyclic alkyl group having from 3 to 25 carbon atoms.

49. (Previously Presented) The process solution of claim 37 wherein the at the at least one surfactant is a surfactant having the following formula (Xa):



wherein R₁ is a straight, a branched, or a cyclic alkyl group having from 3 to 25 carbon atoms; and m is a number that ranges from 0 to 20.

50. (Previously Presented) The process solution of claim 37 wherein the at the at least one surfactant is a surfactant having the following formula (Xb):

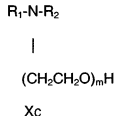




Xb

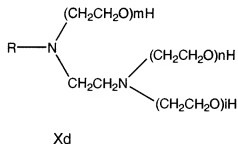
wherein R_1 and R_2 are each independently a straight, a branched, or a cyclic alkyl group having from 3 to 25 carbon atoms; and m and n are each independently a number that ranges from 0 to 20.

51. (Previously Presented) The process solution of claim 37 wherein the at the at least one surfactant is a surfactant having the following formula (Xc):



wherein R_1 and R_2 are each independently a straight, a branched, or a cyclic alkyl group having from 3 to 25 carbon atoms; and m is a number that ranges from 0 to 20.

52. (Previously Presented) The process solution of claim 37 wherein the at the at least one surfactant is a surfactant having the following formula (Xd):



wherein R is independently a straight, a branched, or a cyclic alkyl group having from 3 to 25 carbon atoms; and i, m, and n are each independently a number ranging from 0 to 20.

53. (Previously Presented) The process solution of claim 37 wherein the non-aqueous solvent is at least one selected from the group consisting of: ethylether, ethylene glycol monomethyl ether, 2-methoxyethyl ether, a nitrile, lactates, pyruvates, diols, tetrahydrofuran, acetone, 1,4-dioxane, 1,3-dioxolane, ethyl acetate, cyclohexanone, acetone, 1-methyl-2-pyrrolidone, methyl ethyl ketone, dimethylformamide, dimethylacetamide, N-methyl pyrrolidone, ethylene carbonate, propylene carbonate, glycerol and derivatives, acetic acid anhydride, propionic acid and propionic acid anhydride, dimethyl sulfone, benzophenone, diphenyl sulfone, phenol, m-cresol, dimethyl sulfoxide, diphenyl ether, propylene glycol propyl ether, methanol, ethanol, 3-heptanol, 2-methyl-1-pentanol, 5-methyl-2-hexanol, 3-hexanol, 2-heptanol, 2-hexanol, 2,3-dimethyl-3-pentanol, propylene glycol methyl ether acetate, ethylene glycol, isopropyl alcohol, n-butyl ether, propylene glycol n-butyl ether, 1-butoxy-2-propanol, 2-methyl-3-pentanol, 2-methoxyethyl acetate, 2-butoxyethanol, 2-ethoxyethyl acetoacetate, 1-pentanol, and propylene glycol methyl ether.